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REMARKS

Applicant wishes to thank the Examiner for the attention accorded to the instant application.

Claims 1-2, 4-9 and 16-19 are pending in the application. Applicant has amended claims 1 and 16. No new matter is being added.

I. Claim Rejections – 35 U.S.C. §102

The Examiner has rejected claims 1-2, 4-6, 8 and 16 under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 5,967,577 to Bhandarkar et al. ("Bhandarkar"). The Examiner has rejected claims 1, 2, 4-8 and 16 under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 6,336,492 to Nagaoka ("Nagaoka"). The Examiner has rejected claims 1, 2, 4-6, 8 and 16 under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 2,572,640 to Lovegrove ("Lovegrove"). The Examiner has rejected claims 1, 8 and 16 under 35 U.S.C. §102 as being anticipated by U.S. Patent No. 4,773,687 to Bush et al. ("Bush").

Applicant has amended claim 1 and 16 to more particularly point out and distinctly claim the subject matter regarded as the invention. Applicant has amended claim 1 to additionally recite a plurality of micro-valves attached to the openings at the suction surface level where the plurality of micro-valves are hingedly attached to said openings vacuum source attached to said body at the suction surface level. The present invention, as recited in claim 1, is directed to a handler for applying a vacuum holding force to an object. The handler is comprised of a body for applying a vacuum force which includes a plurality of level openings at various levels where the openings at the suction surface level are larger than the openings at the holding surface level and the

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openings are in fluid communication with at least a portion of openings at the holding surface level. A plurality of micro-valves are attached to the openings at the suction surface level through a hinge to control the suction force.

Claim 16 has been similarly amended to include a plurality of micro-valves attached to the openings at the suction surface level, the plurality of micro-valves hingedly attached to said openings. The present invention, as recited in claim 16, additionally recites a vacuum source attached to said handler body. As recited in claim 16, the present invention is directed to a handler for applying a vacuum holding force to an object. The handler is comprised of a body and a vacuum source attached to the handler body where the handler body is for applying a vacuum force which includes a plurality of level openings at various levels where the openings at the suction surface level are larger than the openings at the holding surface level and the openings are in fluid communication with at least a portion of openings at the holding surface level.

In contrast, Bhandarkar is directed to an apparatus for dispensing fluid in an array pattern. Bhandarkar is directed to a dispenser used for dispensing fluids. There is no teaching or suggestion in Bhandarkar to use a vacuum holding force or even mention of a vacuum force in handling fragile materials. The apparatus disclosed in Bhandarkar is a dispensing apparatus, rather than a vacuum holder. Additionally, Bhandarkar does not teach or suggest the use of micro-valves. Therefore, Bhandarkar does not teach or suggest a handler or handler body for applying a vacuum holding force. Applicant respectfully submits that claims 1 and 16 are allowable over Bhandarkar.

Similarly, Nagaoka is directed to a mounting head apparatus which incorporates a vacuum pump. The Examiner states that Figure 5 teaches openings 27 at the suction

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level that are larger than the openings at the holding level. As stated in Nagaoka, opening 27 is characterized as an internal space.

The connection chamber 12 of the mounting head apparatus 1 is formed by drilling substantially the central portion of a metal block in the form of a substantially rectangular parallelepiped shape into a substantially cylindrical form so that an internal space 27 is formed. Then, one side surface of the metal block is drilled to have a predetermined width so that a groove 28 is formed through which a portion of the internal space 27 is exposed to the outside. Nagaoka column 5 lines 31-36.

Nagaoka only teaches the internal space within the chamber as a parallel pipe cylindrical form. Even if the internal space can be characterized as an opening, there is no teaching or suggestion in Nagaoka for more than one opening. Additionally, Nagaoka does not teach or suggest that these openings are at a suction surface level. Additionally, the openings are not attached to micro-valves. Since Nagaoka does not teach or suggest all of the limitations of amended independent claims 1 and 16, Applicant respectfully submits that claims 1 and 16 are allowable over Nagaoka.

Similarly, Lovegrove is directed to a vacuum film holder for use in cameras for holding films and glass plates. Significantly, Lovegrove teaches that "channels" on the plates are evenly spaced and different sized on different plates. There is no teaching or suggestion that the channels at a "surface level" are larger than the channels at the "holding level," as required, for instance, in claims 1 and 16. Since Lovegrove does not disclose or suggest all the required limitations of claims 1 and 16, Applicant respectfully submits that claims 1 and 16 are allowable over Lovegrove.

Similarly, Bush is directed to a wafer handler with a plurality of ports which flows pressurized gas on to the wafer. There is no teaching or suggestion in Bush to use a vacuum holding force or even mention of a vacuum force in handling fragile materials.

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Additionally, Bush does not teach or suggest the use of micro-valves. Therefore, Bush does not teach or suggest a handler or handler body for applying a vacuum holding force. Applicant respectfully submits that claims 1 and 16 are allowable over Bhandarkar.

A single reference must teach or disclose all of the limitations of the claims in order to anticipate. Since neither Bhandarkar, Nagaoka, Lovegrove nor Bush teach or disclose all of the limitations of claims 1 and 16, Applicant respectfully submits that claims 1 and 16 are patentable over the cited references. Claims 2, 4-9, and 17-19, by their dependency on amended claims 1 and 16, are similarly allowable. Early notice to that effect is earnestly solicited.

II. Claim Rejections – 35 U.S.C. §103

The Examiner has rejected claims 7, 9 and 17-19 as being unpatentable over various combinations of Bhandarkar, Nagaoka, Lovegrove, Bush, U.S. Patent No. 5,564,682 to Tsuji ("Tsuji") and U.S. Patent No. 4,858,975 to Ogawa ("Ogawa").

As previously stated, the present invention, as recited in amended claims 1 and 16, is directed to a handler for applying a vacuum holding force to an object. The handler is comprised of a body for applying a vacuum force which includes a plurality of level openings at various levels where the openings at the suction surface level are larger than the openings at the holding surface level and the openings are in fluid communication with at least a portion of openings at the holding surface level. The handler additionally includes micro-valves attached to the openings at the suction surface level where the plurality of micro-valves are hingedly attached to the openings.

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In contrast, Bhandarkar is directed to an apparatus for dispensing fluid in an array pattern. Bhandarkar is directed to a dispenser used for dispensing fluids. There is no teaching or suggestion in Bhandarkar to use a vacuum holding force or even mention of a vacuum in handling fragile materials. Additionally, there is no teaching or suggestion in Bhandarkar for the use of micro-valves in the dispenser. Therefore, Bhandarkar does not teach or suggest a handler or handler body for applying a vacuum holding force.

Similarly, Nagaoka is directed to a mounting head apparatus which incorporates a vacuum pump. The Examiner states that Figure 5 teaches openings 27 at the suction level that are larger than the openings at the holding level. As stated in Nagaoka, opening 27 is characterized as an internal space.

The connection chamber 12 of the mounting head apparatus 1 is formed by drilling substantially the central portion of a metal block in the form of a substantially rectangular parallelepiped shape into a substantially cylindrical form so that an internal space 27 is formed. Then, one side surface of the metal block is drilled to have a predetermined width so that a groove 28 is formed through which a portion of the internal space 27 is exposed to the outside. Nagaoka column 5 lines 31-36.

Nagaoka only teaches the internal space within the chamber as a parallel pipe cylindrical form. Even if the internal space can be characterized as an opening, there is no teaching or suggestion in Nagaoka for more than one opening. Additionally, Nagaoka does not teach or suggest that these openings are at a suction surface level.

Similarly, Tsuji is directed to a wafer stage apparatus for attaching and holding semiconductor wafers. Although Tsuji is directed to a wafer stage coupled with a vacuum line, the valves are actuated by electromagnetic waves rather than by fluid connections. Significantly, Tsuji does not teach or suggest multiple stages or variations in opening sizes between stages.

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Similarly, Lovegrove is directed to a vacuum film holder for use in cameras for holding films and glass plates. Significantly, Lovegrove teaches that "channels" on the plates are evenly spaced and different sized on different plates. There is no teaching or suggestion that the channels at a "surface level" are larger than the channels at the "holding level," as required, for instance, in claims 1 and 16. Since Lovegrove does not disclose or suggest all the required limitations of claims 1 and 16, Applicant respectfully submits that claims 1 and 16 are allowable over Lovegrove.

Similarly, Bush is directed to a wafer handler with a plurality of ports which flows pressurized gas on to the wafer. There is no teaching or suggestion in Bush to use a vacuum holding force or even mention of a vacuum force in handling fragile materials. Additionally, Bush does not teach or suggest the use of micro-valves. Therefore, Bush does not teach or suggest a handler or handler body for applying a vacuum holding force. Applicant respectfully submits that claims 1 and 16 are allowable over Bhandarkar.

The Examiner is reminded that to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references) must teach or suggest all of the claim limitations. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991).

As stated previously, neither Bhandarkar, Nagaoka, Lovegrove, Bush, Tsuji nor Ogawa teach or suggest all of the claim limitations of claims 1 and 16. Since the cited references do not teach or suggest all of the claim limitations, either alone or in

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combination with each other, a prima facie case of obviousness has not been set forth. Applicant, therefore, respectfully submits that claims 1 and 16 are allowable over the cited references. Claims 7 and 9, by their dependency on amended claim 1, and claims 17-19, by their dependency on amended claim 16, are similarly allowable.

III. Conclusion

For the foregoing reasons, Applicants respectfully submit that all pending claims 1-2, 4-9 and 16-19 are now in condition for allowance. Early notice to that effect is earnestly solicited.

Respectfully submitted,

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